

## **Written evidence submitted by Agxio (FS0042)**

September 2022

Agxio is a UK AI, data science, and machine learning company that specialises in the agricultural science, biotech, and life sciences industries. We have developed a range of expert AI applications that deliver advanced, beyond-human-scale solutions to solve complex, real-world business problems. Agxio has a research hub in Cambridge, a development centre in the Aberystwyth Innovation and Enterprise Centre, and is the Welsh Government's strategic partner for agri-tech innovation.

Our technology helps achieve food security by increasing productivity and reducing costs for the agri-food sector and improves the sustainability of the sector through reduced inputs, wastage, and emissions outputs. The exporting of our technology internationally contributes to securing the global agri-food supply chain and macro food security. We welcome the opportunity to share views with the inquiry on two fronts.

Firstly, on the proposals in the food strategy relating to promoting the uptake of new technologies in the agricultural sector that will contribute towards food security.

Secondly, regarding encouraging uptake of and developing the future skills required in the agri-food sector.

### **How will the proposals in the Government's food strategy policy paper affect the agri-food sector?**

#### **1 Promoting uptake of agri-tech innovations**

1.1 Agri-tech is already helping farmers to boost productivity, realise efficiencies, and reduce their environmental impacts, however, there is a need to improve uptake by farmers if the full impact for food security and other benefits are to be realised. Research indicates that the farming industry is open to technology transformation but hurdles such as generational and scale issues, with younger farmers and those with larger farms having higher adoption rates, and the barriers of a lack of knowledge and the investment required looming large. A 2022 NFU Mutual survey of farmers found only 14% stating they planned to invest in agri-tech this year, with almost half of respondents citing a lack of knowledge as holding them back from investing in agri-tech and 30% a lack of access to finance as limiting<sup>1</sup>.

1.2 Some excellent organisations and initiatives, such as the four Agri-Tech Centres, the Global Centre for Excellence in Agri-Robotics, and the Agriculture and Horticulture Development Board (AHDB), already exist to support research and innovation development to drive change. The food strategy plan to create a What Works Centre

---

<sup>1</sup> <https://www.nfumutual.co.uk/media-centre/2022/january-2022/lack-of-knowledge-holding-farmers-back-from-investing-in-agri-tech-nfu-mutual-survey-reveals/>

to provide farmers with evidence that supports the adoption and on-farm take-up of new innovations is most welcome. Hands-on experience and tailored guidance that demonstrates the most suitable technologies for individual cases, demonstrates a clear value proposition, and reassures farmers that technologies are reliable and won't become outdated rapidly will be valuable in encouraging confidence, adoption and optimised decision making. This would also help address the perception among some farmers that innovations are developed alone by theorists so don't meet their needs and are suitable only for large-scale and industrial farming.

- 1.3 Adequate training is important to get the most benefit out of technologies, yet a 2021 survey found only half of farmer respondents rated their skills with agri-tech as good and less than half felt supported to introduce or make better use of existing technology<sup>2</sup>. With a lack of accessible training another barrier to uptake and achieving optimum productivity, there is potential for the What Works Centre to include a training element to provide support at or post purchase. Alternatively, the forthcoming complementary Institute for Agriculture and Horticulture (TIAH), which will help farmers and growers to access the right skills to run professional, sustainable, and profitable businesses, could incorporate this training support element to boost skills in agri-tech operation as well. Collaboration with industry could see agri-tech providers contributing to the delivery of these training schemes to increase farmer confidence, with the potential for a strong online learning element too.
- 1.4 Additionally, there is the potential to coordinate with industry to introduce a national scheme through the What Works Centre to encourage an increase in the number of pilots of new technologies on farms of all sizes across crop and livestock production, allowing more farmers to experience benefits directly and to receive early training on agri-tech solutions.
- 1.5 The agriculture industry is under significant financial pressure, on already small margins, hindering the uptake of agri-tech solutions. An advice service could be incorporated into the What Works Centre that provides information on funding sources and grants and helps with applications. For farmers and producers taking on commercial loans and other types of financing to increase their productivity and efficiency, it may be possible to introduce targeted tax breaks to support adoption and reduce the time until investments have paid for themselves.
- 1.6 Regarding industrial horticulture, we welcome the plans to include it alongside other manufacturing sectors and in decisions on energy policy and to review the planning permission process to support new developments of controlled environment growing operations. We hope that the planning permission review would take into account smaller urban operations in addition to out-of-town and rural multi-acre glasshouses and vertical farms, to create more locally produced food with reduced produce and labour transportation emissions.

---

<sup>2</sup> <https://agri-epicentre.com/news/uk-farmers-confident-about-benefits-of-agri-tech-but-unsure-of-its-role-in-net-zero-new-research-suggests/>

1.7 In summary, the What Works Centre has the potential to provide great value in overcoming the lack of knowledge among farmers to support the adoption and on-farm take-up of agri-tech. As well as clearly demonstrating the variety available, value propositions, and reliability of technologies, there is the opportunity to address other key barriers to adoption through the Centre and TIAH, acting as a hub that supports training, encourages an increase in pilots through a national scheme, and incorporates financing signposting. Targeted tax breaks could also alleviate the off-putting/unaffordable nature of initial capital outlays for some smaller farms.

## **2 Skills and talent pipeline**

2.1 It is most welcome to see the food strategy policy paper discussing the vital need to ensure that the agri-food industry workforce has the necessary skills to take advantage of new and emerging innovations and working with industry to review existing skills programmes, identify improvements, and tackle barriers that currently prevent uptake.

2.2 The Automation in horticulture review<sup>3</sup> (July 2022) identified skills as one of the barriers preventing the development and adoption of the next generation of technology. Specifically, “Skills required to develop, install, operate, and maintain the next generation of automation technologies will likely be Science, Technology, Engineering and Maths (STEM) based. Traditional horticulture has limited need for engineering and digital skills, with new innovations driving the need for STEM skills.”

2.3 An early element of this barrier is a shortage of school-age students currently moving on to STEM subjects, which will be essential to contributing to the skilled future workforce the agri-food industry requires in the medium to long term. Children’s love for STEM is on the decline, with interest in Science amongst 9 to 12-year-olds falling 10%, Design and Technology down 12% and ICT / Computing falling furthest at 14% over the last four years.<sup>4</sup>

2.4 Without sufficient numbers of pupils becoming engaged with and pursuing STEM subjects at school, the pipeline of talent available to the sector will be limited. Consequently, the benefits delivered by automation and precision agriculture technology will not be harnessed to their full potential and the positive impact they offer for food security and boosting productivity and pay will not be realised to their greatest extent.

2.5 As part of the measures stated in the food strategy to build a strong food curriculum and to ensure a talent pipeline with the requisite skills for the agri-food industry, there is the potential to replicate successful existing projects between schools, not-

---

<sup>3</sup> <https://www.gov.uk/government/publications/defra-led-review-of-automation-in-horticulture/automation-in-horticulture-review#:~:text=The%20review%20was%20to%20bring,aim%20of%20reducing%20the%20sector's>

<sup>4</sup> <https://www.engineer-a-better-world.org/find-out-more/>

for-profits, and private enterprise that inspire school-age students to pursue STEM subjects.

- 2.6 Targeted school educational projects that utilise partnerships between the public, social, and private sectors boost education about healthy, nutritious food and contribute to long-term food security and levelling up by helping to ensure the future workforce has the necessary, high-wage skills the agri-food sector requires.
- 2.7 As an example, the successful Tech Tyfu Twf project run by Welsh social enterprise Menter Môn places vertical farming units in schools. This involves students in real-life projects, growing healthy and tasty vegetables, combining academic learning, engaging practical tasks, key skills development, and state-of-the-art technology.
- 2.8 Project staff help to design and deliver bespoke lessons on vertical farming (closed environment agriculture (CEA)) to all secondary key stages, with flexible emphasis depending on the aims of the curriculum.
- 2.9 The addition of Agxio's machine learning and sensor analytics platform enables the collection, analysis, and manipulation of schools' vertical farming data. This expands the reach of the project to different subject areas, creating applications for IT, programming, data processing and engineering. Such technologies will be essential elements of future farming in both the traditional agriculture and CEA sectors and provide high-wage, high-skilled jobs. It also enables pupils without access to CEA units to benefit from hands-on experience with the platform and provides a solid grounding for moving on to related T-levels.
- 2.10 Such projects also deliver other key objectives in the food strategy and contribute toward improving access to healthy food and food security in the short term. The fresh food grown by pupils on-site at schools is available to be consumed by the school community and can also be provided to local businesses.
- 2.11 The project has been achieved in a comparable way to that in which Local Food Partnerships bring together councils and partners from the public sector, voluntary and community groups, and businesses.
- 2.12 In summary, multiple desired outcomes relating to food security, nutrition, local production, requisite skill development, levelling up, and additional cross-departmental aims, can be achieved through innovative partnership projects in schools such as Tech Tyfu Twf. A stronger pipeline of the talent required by the agri-food sector is built to provide the skills it needs to flourish in the future and more people to gain access to high-skilled, well-paid jobs within the sector in the future, and healthy, more sustainable, locally produced food can be grown by pupils for consumption.